

Attendees:

EPA: Jillian Adair, Micka Peck, Greg Voigt, Evelyn MacKnight

DOEE: Jeffrey Seltzer, Jonathon Champion

MDE: Anna Kasko, Chris Beck

Meeting Notes:

1) San Francisco (SF) Research (Jillian)

- a. SF receives, on average, 23.6 inches of rain per year over 68 days, while DC receives 40.8 inches over 115 days; meaning that SF receives about 60% of the rain that DC does.
- b. The State implemented a “0 discharge” prohibition for MS4s, but determines compliance based on the construction of full capture systems in priority land uses (high-density residential, industrial, commercial, mixed urban, and public transportation stations). If full capture systems aren’t constructed in certain areas, jurisdictions must use the “track 2 approach” to show that trash accumulates at acceptably low levels (i.e. 5 gallons/acre/yr). Most MS4s choose to install full capture systems, but some have used the track 2 approach successfully.
- c. The track 2 approach is documented through on-land visual trash assessments (OVTA) of neighborhood streets and sidewalks. OVTA protocol requires MS4s to assess and score their streets and sidewalks on an A - D scale. After trash reduction implementation, they re-conduct monitoring. Areas with consistent scores of “A” are considered to be in full compliance.
- d. A comprehensive study (2016) of the OVTA methodology confirmed that OVTA scores reasonably predict trash quantities entering stormwater conveyances.

Table 1.1. Trash generation categories and associated “best/midpoint” rates and ranges (gallons/acre yr⁻¹).

Category	Low	Moderate	High	Very High
Trash Generation Rate (gallons/acre yr ⁻¹)	2.5 (0-5)	7.5 (5-10)	30 (10-50)	100 (50-150)

- e. The study also provided suggestions on the design and frequency of OVTA sampling.
 - i. OVTAs should be conducted (1) during wet and dry seasons, (2) halfway between reoccurring street sweeping events, and (3) only when less than 0.5 inches of rainfall has occurred in a 24 hr period within 2 days prior of sampling.
 - ii. Quite predictably, the study also found that (1) trash is generated consistently throughout the year, (2) wind and dumping contribute significant amounts of trash to sewers, (3) recent rain does improve overall OVTA and street scores, but not sidewalk scores, (4) scores on streets worsened within a few days after street sweeping and then stabilized after 7-14 days, and (5) scores on sidewalks were not affected much by street sweeping.
 - iii. In addition, the study suggested that a site should be assessed between 2-4 times to achieve an acceptable level of error and that OVTAs should be

conducted on at least 10% of the street miles within the area where control measures are implemented.

- f. SF conducted a comprehensive study on trash generation in 2014. 159 sites with small full capture systems were monitored 3-4 times. These sites generally represented one land-use and income bracket.
- g. Annual trash generation rates (gallons/acre) were developed for 6 land use classes, 2 of which are affected by income bracket. With the exception of residential and retail uses, best generation rates are represented by the mean generation rate for that land use. Low and high rates are represented by the 10th and 90th percentiles. For residential and retail land uses, best generation rates are represented by the “best fit” regression line based on the household median income in the area surrounding a site. Low and high generation rates are represented by the 5th and 95th confidence intervals, respectively.

Table 4.2. San Francisco Bay Area annual trash generation rates for stormwater (gal/acre).

Land Use	Low ^b	Best ^b	High ^b
Commercial & Services	0.7	6.2	17.3
Industrial	2.8	8.4	17.8
Residential ^a			
Less than \$50,000/yr	2.8-30.2	8.2-87.1	24.2-257
\$50,000-\$100,000/yr	0.9-2.8	2.5-8.2	7.4-24.2
Greater than \$100,000/yr	0.3-0.9	0.5-2.5	1.0-7.4
Retail ^a			
Less than \$50,000/yr	10.4-110	78.2-150	202-389
\$50,000-\$100,000/yr	2.1-10.4	15.5-78.2	40.0-202
Greater than \$100,000/yr	0.7-2.1	1.8-15.5	4.6-40.0
K-12 Schools	3	6.2	11.5
Urban Parks	0.5	5.0	11.4

^a For residential and retail land uses, trash generation rates are provided as a range, which takes into account the correlation between rates and household median income.

- h. Other results:
 - i. Trash generation is relatively consistent over time. No seasonal differences.
 - ii. High variability within land-use classes, especially retail and residential. 30 other factors were explored to explain variability using single and multiple regression.
 - iii. The log of median household income better predicts trash generation in retail and residential land-uses.
 - iv. In retail, the number of fast food restaurants within a mile of the site was also predictive.
 - v. In residential, the percentage of individuals with no high school diploma in the area around the site and the number of males between the ages of 10 and 29 living near a site were also predictive.
 - vi. Trash generation results were not statistically different from Los Angeles (LA) studies.
 - vii. An estimated 64% of the jurisdictional urban land area generates trash at a low level (< 5 gal/acre).

- i. Trash quantities collected from two 50-acre areas with hydrodynamic separators were compared to predicted trash values. The percent difference was between 85-87% with the study overpredicting trash values. The SF rates were compared to the LA rates and those in similar land-use classes did not statistically differ and both were about equally variable.
 - j. SF is only just piloting a similar A – D scoring system for trash along streambanks.
- 2) San Francisco (SF) Structural Controls (Jillian)
- a. SF regional water boards review and approve acceptable partial and full capture systems. The State is currently working on approving these technologies statewide. Full capture systems are required to capture all particles over 5 mm in size for a 1-hr-1yr storm (up to 0.6 inches in SF). Structural controls are generally separated into 3 types.
 - b. Screens/filters in a storm drain inlet: most are stainless steel filters or baskets that block outflow pipes. They cost about \$1-1.5k with a 10-20-year lifespan.
 - c. In-line or off-line systems constructed in storm drain systems (such as hydrodynamic separators): These use centrifuging to collect and screen floatables. These systems can treat very larger areas, but require relatively high gradients. They can cost several hundred thousand dollars. The engineer who I spoke with suggested it would be extremely difficult to install a large enough underground system to treat our 1.4 inch 1-hr-1-yr storms. SF designs them to treat up to a 0.6 inch 1-hr-1-yr storm.
 - d. End-of-pipe screens and in-stream booms: These are a last resort for SF.
- 3) Group Discussions on SF Research and TMDL Endpoint Options
- a. MDE: The SF research is interesting and helpful, but don't think stakeholders will look favorably at using SF's trash generation rates in the Anacostia. Stakeholders prefer site-specific data.
 - b. DOEE: How do the SF trash generation rates compare to our Anacostia TMDL rates? Can we run their rates in DC just to roughly compare predicted values? Don't think we necessarily need to recalculate the baseline load from the 2010 TMDL because the TMDL is already a good motivator for trash reduction implementation, but analyzing a rough comparison between the 2 cities might prove useful for our own research.
 - c. MDE: If wind-blown is such a major contributor to trash, will large hydrodynamic separators even work to reduce trash in-stream?
 - d. EPA: Agreed that the technology implemented in SF is probably not going to be suitable for Anacostia conditions.
 - e. EPA: Would it be beneficial to bring endpoint considerations up to ACWA or other national experts? How does DOEE/MDE feel about this? Similarly, it also may be beneficial to have the MS4s, DC Water, and the environmental groups comment on the endpoint options. The letter from DC Water sent to EPA and DOEE also suggests that they want to be involved in the TMDL development process and would appreciate stakeholder involvement.
 - f. DOEE: We could solicit other experts' opinions, but we ultimately decide on the endpoint. Bringing up the issue to ACWA may send us down a rabbit hole.

- g. All: Agreed that sending a proposal to our stakeholders may be best. Perhaps we want to present our preferred approach and solicit their comments as opposed to presenting a variety of options.
 - h. EPA: The TMDL already sets up a great framework to address trash in the Anacostia. Can we define the TMDL endpoint as “0” and present a variety of potential implementation approaches to remove 100% of the baseline load and aid post-TMDL efforts? This corresponds to our option 1.
 - i. DOEE: Yes, and we can increase the margin of safety in the TMDL to address uncertainty if needed.
 - j. All: Agreed that our next step is likely to present our preferred approach to our stakeholders and solicit comments.
- 4) Next Steps
- a. Jillian will send SF’s trash generation rate study results to DOEE and DOEE will apply SF’s trash generation rates in DC to roughly compare with the 2010 TMDL values.
 - b. Jillian will draft a document that we can use to present our “0” endpoint approach to the stakeholders.